

Note upon the Determination of the Longitudes of Kurrachee and Madras. By Major-Gen. Thomas Addison, C.B.

In 1874 arrangements were made for exchange of galvanic signals for difference of longitude between the German Observers of the Transit of *Venus* at Ispahan and my station at Kurrachee, and also between the latter and the Madras Observatory.

Between the two former stations 225 signals were exchanged on the 11th and 12th December, and on the 13th 200 between Madras and Kurrachee.

Professor Auwers has favoured me with the results of the first sets, and Mr. Pogson did the same in the case of those with him. They are

	Difference of Longitude.		
	h	m	s
Ispahan—Kurrachee	1	1	13.09
Kurrachee—Madras	0	53	6.22

Dr. Becker, of the Royal Observatory, Berlin, has further kindly communicated to me the difference of longitude, similarly obtained, between Berlin and Ispahan; and as that between Greenwich and Berlin is given in the *Nautical Almanac*, the whole chain is thus completed from Greenwich to Madras. It stands thus.

		h	m	s
Berlin, east of Greenwich	By <i>Nautical Almanac</i>	0	53	34.9
Ispahan, east of Berlin	By galvanic signals by Dr. Becker and Dr. Fritsch	2	33	5.44
Kurrachee, east of Ispahan	By galvanic signals between Drs. Becker and Fritsch and General Addison	1	1	13.09
Madras, east of Kurrachee	By galvanic signals between Mr. Pogson and General Addison	0	53	6.22
Madras, east of Greenwich		5	20	59.65

Both Professor Auwers and Mr. Pogson expressed themselves well satisfied regarding the reliableness of the signalling operations, and I feel every confidence in the final result as concerns Madras.

That for Kurrachee has an element of doubt in it, inasmuch as I neglected to obtain the pivot error of my Transit Instrument. But to whatever extent the pivot error affected the result as regards Kurrachee, the difference between Ispahan and Madras remains unaffected, the errors on the east and west sides of Kurrachee correcting each other.

In the *Monthly Notices* of the Royal Astronomical Society for March 1872 are recorded the results obtained by Colonel Walker and Major St. John by telegraph between Teheran and Greenwich, from which was deduced the longitude of Teheran, viz.

$$51^{\circ} 24' 26'' \quad \text{or} \quad 3^{\text{h}} 25^{\text{m}} 39^{\text{s}}.73.$$

Major St. John had previously obtained the difference Teheran—Kurrachee. He does not give it, but he states that these two operations, combined with those of the great Trigonometrical Survey of India, bring out the longitude of Madras within half a minute of arc of that given in the *Nautical Almanac*.

The latter is $5^{\text{h}} 20^{\text{m}} 57^{\text{s}}.3$; therefore he must have made the difference Teheran—Kurrachee $1^{\text{h}} 55^{\text{m}} 17^{\text{s}}.57 \pm 2^{\text{s}}$.

In 1874 Dr. Becker determined the difference between Teheran and Ispahan, and this affords us the means of comparing the operations of 1872 and those of 1874.

According to Dr. Becker the difference Teheran—Ispahan is $58^{\text{s}}.8$, and as Ispahan—Madras is $1^{\text{h}} 54^{\text{m}} 19^{\text{s}}.3$, there results for Teheran—Kurrachee, by the operations of 1874, $1^{\text{h}} 55^{\text{m}} 18^{\text{s}}.11$, from which Major St. John differs by $54^{\text{s}} \pm 2^{\text{s}}$. The local time was obtained by Colonel Walker, by Sextant, that by Dr. Becker by Transit Instrument.

The longitude of Teheran obtained by Colonel Walker does not quite agree with that obtained by Dr. Becker. The latter was

	h	m	s
Berlin—Teheran	2	32	6.68
Long. Berlin by <i>Nautical Almanac</i>	0	53	34.9
Resulting longitude of Teheran	3	25	41.58,

from which Colonel Walker differs by $1^{\text{s}}.85$.

At Kurrachee my Observatory was $0^{\text{s}}.6$ east of that used in the great Trigonometrical Survey of India at that place. Major St. John's exact station is not given.

The Hill House, Melton, Suffolk,
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Extract from a Letter from R. J. Ellery, Esq., to the Astronomer Royal, dated Melbourne, 1877, October 3.

MY DEAR SIR GEORGE,—Your telegram of the 17th August relative to suspected satellites of *Mars* reached me on the 22nd, and we have taken every opportunity since of searching, but as yet without success. Unfortunately the great telescope has been *hors de combat*, part of the declination movement having broken. This is now nearly repaired, and in the meantime the